



September 6, 2016

Ms. Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20054

Via Electronic Filing

Re: GN Docket No. 16-245; Inquiry Concerning the Deployment of Advanced Telecommunications Capability to All Americans in a Reasonable and Timely Fashion, and Possible Steps to Accelerate Such Deployment Pursuant to Section 706 of the Telecommunications Act of 1996, as Amended by the Broadband Data Improvement Act

Dear Ms. Dortch,

I¹ offer these comments to aid the Commission in selecting and framing the issues to be investigated in the above titled inquiry on the 706 report.

First Recommendation: Develop a coherent methodology

This report to Congress on the state of broadband in the US will be the twelfth in the series. Regardless of its contents, we will not be able to examine the entire series as a unit to observe trend lines in any coherent way. This is odd because trend lines moving in the right direction are the hallmarks of progress.

This sad state of affairs comes about because every 706(b) report reads as if it were the first ever undertaken. Consequently, my overarching desire is for the Commission to recognize that the 706 report is a continuing obligation that should be discharged in a consistent, coherent, and objective fashion from year to year.

This means creating a methodology that does not require the FCC to create a new magic number for download speed and related metrics every year in order to exclude developments in hard-to-serve communities that are indications of progress. It also means defining “advanced telecommunications capability” in terms of application support rather than as a network-intrinsic capability. And it also means refraining from introducing

¹ I am an independent network engineering consultant and policy analyst, presently working at High Tech Forum as editor and founder. These remarks are offered in my personal capacity and do not necessarily represent the opinions of any client or sponsor. I have previously offered comments in several FCC inquiries and NPRMs, including the “Preserving the Open Internet” and “Broadband Industry Practices” dockets, GN 09-191 and WC 07-52 respectively. I offered testimony at the [FCC En Banc Public Hearing on Broadband Network Management Practices in Cambridge on February 25, 2008](#) as an invited technical expert. My CV is available at <http://www.bennett.com/resume.pdf>.

squishy new network metrics that neither the Commission nor anyone else can measure or evaluate.

Second Recommendation: Use clear terminology

The Notice of Inquiry asks a number of interesting questions about measurement, and even goes so far as to introduce a novel term, “service consistency”, which it defines as “how often a particular speed is provided” while clarifying that it is somehow distinct from both speed and latency.

My first recommendation is to refrain from using terms whose meaning is unclear. The FCC is a regulator with an enormous impact on the national economy, and the attempt to hold parties responsible to unknowable standards causes harm through uncertainty. The engineering literature already contains a rich vocabulary, hence it is unnecessary to pursue novel metrics.

A broadband service is either on or off. When it is on – operational – it functions at a fixed signaling rate unless it is a wireless service. Wired Internet services are statistical in nature, which means that signaling rate is qualified by latency, which is best understood as time packets reside in network or end system buffers prior to or subsequent from transmission.

If the Commission is concerned about statistical effects that lead to variations in latency, the term it should use is “jitter”, which I used in my 2008 presentation to the FCC at its 2008 Harvard Field Hearing on net neutrality. If it is interested in examining “uptime,” it should use that term. And if it is interested in variations in signaling rate in wireless systems as result of signal degradation with distance or because of interference, it should say so.

As it stands, “service consistency” is a term understood only by the Commission and not fully defined to the public.

Third Recommendation: Consult public research

The FCC is not the only institution in the world with an interest in assessing broadband quality. The relative standing of the US in relation to the rest of the developed world has been the focus of a great deal of academic research by myself and others, but the 706 reports rarely explore this research in depth.

Similarly, the relative quality of urban broadband compared to rural broadband is a widely studied topic. The FCC does not need to duplicate readily-available research unless a study of this literature reveals shortcomings.

Such shortcomings do exist in regard to specific issues of deployment. The FCC’s reports on broadband quality are out-of-date by the time they are published because of delays in analyzing the data. The input data to the 706 report needs to be as up-to-date as possible, and it needs to be more comprehensive.

Broadband is a dynamic sector characterized by continuing investment in higher speeds and better quality generally. Consequently, surveys of current investment are more meaningful of historical speed measurements such as SamKnows testing. Broadband

speeds are measured by Ookla and Akamai, both of which datasets are closer to current realities than the FCC's dated and overly vague measurements. They also reflect real-world conditions more accurately than dedicated white box testing does.

Therefore the 706 report should rely more on Ookla, Akamai, and published research than on Measuring Broadband America data. White box testing can be useful if and only if it is enhanced to capture Quality of Service impacts on applications. This is not the current norm, but it is an avenue that other countries are pursuing with the advice of consultants such as myself and [Predictable Network Solutions in the UK](#). Please consult the [High Tech Forum podcast on this subject with Neil Davies](#).

Recommendation Four: Stick to the subject matter

The FCC is in an inherent conflict of interest in preparing the 706 report because its findings relate directly to the agency's size, power, and budget. Hence, the Congressional mandate for the FCC to both analyze and take actions to enforce its findings incentivizes the agency to make pessimistic findings.

It would be wise for Congress to split the tasks of analysis and policy actions between agencies or parties in order for the public interest to take precedence over the FCC's institutional interests.

The 706 mandate also requires the FCC to make assessments that the agency is not well-qualified to perform. The FCC has proved that it has significant expertise in matters of radio performance but limited understanding of the Internet and the applications that make the Internet appealing to the public. While the FCC has tried to raise its game in matters of Internet performance measurement, it still conducts speed surveys that lack sophistication.

The FCC has also proved that its understanding of Internet Quality of Service and Quality of Experience is below par. [FCC recommendations on the so-called "Broadband Facts" disclosure label](#) are not at all helpful to consumers and innovators, for example.

The plain reality is that broadband service in urban and suburban America is more than sufficient for users to enjoy the benefits of all the widely used applications that require advanced broadband network capabilities.

Recommendation Five: Focus in rural America

We can't say the same thing for all of rural America, however. And for this reason the focus of this inquiry should mainly fall on un-served and under-served rural communities.

Specifically, Congress needs to know which methods of improving rural service are working and which are failing. And it needs for these areas to be identified by realistic standards that reflect genuine application needs.

There is no need for the FCC to engage on a quest for Gigabit-to-the-Farm if farms don't actually need such service this year or next. Consequently, the 706 inquiry will fail once again if it does not include a survey of rural broadband applications and their precise, specific needs in terms of speed, jitter, and Quality of Service.

Armed with that information, the 706 report can assess deployment and examine options for acceleration to the extent that any such acceleration is needed. This is the information that Congress needs and wants. This may be an election year but that doesn't mean the FCC should be playing politics.

Conclusion

I have attached some relevant posts from High Tech Forum pertaining to the inquiry.

/signed/

Richard Bennett